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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,286	03/27/2007	Katsumi Kushiya	Q95660	4082

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EXAMINER	
WALCK, BRIAN D	

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1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,286	KUSHIYA ET AL.	
	Examiner	Art Unit	
	Brian Walck	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) *1 and 2* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 March 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-2, drawn to an integrated thin-film solar cell.

Group II, claim(s) 3-6, drawn to a process for producing an integrated thin-film solar cell.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the groups lack a common special technical feature. The express "special technical features" is defined as meaning those technical features that define a contribution which each of the inventions, considered as a whole, makes over the prior art." (Rule 13.2).

Unity exists only when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding claimed special technical features. In this case, the technical feature shared by each invention is the integrated thin-film solar cell of instant claim 1.

The question of unity of invention has been reconsidered retroactively by the examiner in view of the search performed; a review of JP 2002-319686 A to Shimakawa

et al reveals the solar cell of instant claim 1. This makes clear that the inventions of the groups 1-2 lack the same or corresponding special technical feature because the cited reference(s) appear to demonstrate that the claimed technical feature does not define a contribution which each of the inventions, considered as a whole, makes over the prior art. Accordingly, the prior art of the record supports restriction of the claimed subject matter in to the groups as mentioned immediately above.

2. During a telephone conversation with Mark Boland on 7/13/20009 a provisional election was made without traverse to prosecute the invention of group 2, claims 3-6. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-2 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

4. The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder**. Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Information Disclosure Statement

5. The information disclosure statement filed 6/26/2006 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The terms "good linearity" and "close positional relationship" in claim 6 is a relative term which renders the claim indefinite. The terms "good linearity" and "close positional relationship" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. This renders the spacing and shape of the grooves or gaps indefinite which renders the scope of the claim indefinite.

Claim Rejections - 35 USC § 102/103

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 3-5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 2002-319686 to Shimakawa et al (cited by applicant in IDS, an English translation has been provided with this office action for applicant's convenience).

Regarding claim 3, Shimakawa discloses a process for producing an integrated thin-film solar cell comprising a substrate and constitutional thin films containing a metal back electrode layer on the substrate, a multi-element compound semiconductor thin film having a p-type conductivity and being provided as a light absorbing layer on the

metal back electrode layer, a metal oxide semiconductor thin film having an opposite type conductivity against the multi-element compound semiconductor thin film, having a wider bandgap, being transparent, having electroconductivity, and being provided as a window layer on the multi-element compound semiconductor thin film, and a buffer layer comprising a mixed crystal compound semiconductor thin film at an interface between the light absorbing layer and the window layer, wherein the process comprises a first patterning step of patterning (forming a pattern) by removing a part of the metal back electrode layer in a thin line form, a second patterning step of patterning (forming a pattern) by removing a part of the light absorbing layer or a part of the light absorbing layer and the buffer layer in a thin line form with a prescribed offset with respect to the pattern formed in the first patterning step as a reference position, and a third patterning step of patterning (forming a pattern) by removing a part of the light absorbing layer, the buffer layer and the window layer in a thin line form with a prescribed offset with respect to the pattern formed in the first patterning step or the second patterning step as a reference position, wherein the second patterning step and the third patterning step are conducted by a mechanical scribing method of removing a part of a target accumulated thin film layer by mechanically scribing with a metal stylus having a pointed tip end, in which the tip end of the metal stylus is slid to remove the layers up to the light absorbing layer by mechanically scribing, and wherein the first patterning step, the second patterning step and the third patterning step are conducted in this order, so as to remove mechanically the constitutional thin film layers of the target thin-film solar cell and to form grooves or gaps for dividing the thin-film solar cell into unit cells in a strip

shape, whereby an integrated thin-film solar cell having a structure containing a prescribed number of the divided unit cells being connected in series is obtained (Shimakawa, para [0004-0005] and figure 5)

Shimakawa does not explicitly disclose using an ultrathin film layer formed secondarily on a surface of the metal back electrode layer upon forming the light absorbing layer as a solid lubricant for the mechanical scribing step. However, Shimakawa discloses that a thin film of $MoSe_2$ exists on a surface of the metal back electrode layer (Shimakawa, para [0007]). This $MoSe_2$ layer would either inherently or would be expected to act as a solid lubricant for the mechanical scribing step as the mechanical scribing step of Shimakawa appears to be no different than the instantly claimed mechanical scribing step. Therefore, a rejection based alternatively on either 35 U.S.C. 102(b) or 35 U.S.C. 103(a) is eminently fair and acceptable.

Regarding claim 4, Shimakawa discloses that the metal back electrode layer is molybdenum and the first patterning step is conducted by a laser method (Shimakawa, para [0004]).

Regarding claim 5, Shimakawa discloses that the metal back electrode layer is molybdenum, and the ultrathin film layer formed secondarily on the surface of the metal back electrode layer is molybdenum selenide (Shimakawa, para [0004] and [0007]).

13. Claims 3-5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 10-200142 A to Toyoda et al (cited by applicant in IDS, an English translation has been provided with this office action for applicant's convenience).

Regarding claim 3, Toyoda discloses a process for producing an integrated thin-film solar cell comprising a substrate and constitutional thin films containing a metal back electrode layer on the substrate, a multi-element compound semiconductor thin film having a p-type conductivity and being provided as a light absorbing layer on the metal back electrode layer, a metal oxide semiconductor thin film having an opposite type conductivity against the multi-element compound semiconductor thin film, having a wider bandgap, being transparent, having electroconductivity, and being provided as a window layer on the multi-element compound semiconductor thin film, and a buffer layer comprising a mixed crystal compound semiconductor thin film at an interface between the light absorbing layer and the window layer, wherein the process comprises a first patterning step of patterning (forming a pattern) by removing a part of the metal back electrode layer in a thin line form, a second patterning step of patterning (forming a pattern) by removing a part of the light absorbing layer or a part of the light absorbing layer and the buffer layer in a thin line form with a prescribed offset with respect to the pattern formed in the first patterning step as a reference position, and a third patterning step of patterning (forming a pattern) by removing a part of the light absorbing layer, the buffer layer and the window layer in a thin line form with a prescribed offset with respect to the pattern formed in the first patterning step or the second patterning step as a reference position, wherein the second patterning step and the third patterning step are conducted by a mechanical scribing method of removing a part of a target accumulated thin film layer by mechanically scribing with a metal stylus having a pointed tip end, in which the tip end of the metal stylus is slid to remove the layers up to the light absorbing

layer by mechanically scribing, and wherein the first patterning step, the second patterning step and the third patterning step are conducted in this order, so as to remove mechanically the constitutional thin film layers of the target thin-film solar cell and to form grooves or gaps for dividing the thin-film solar cell into unit cells in a strip shape, whereby an integrated thin-film solar cell having a structure containing a prescribed number of the divided unit cells being connected in series is obtained (Toyoda, para [0004-0007] and figure 5)

Toyoda does not explicitly disclose using an ultrathin film layer formed secondarily on a surface of the metal back electrode layer upon forming the light absorbing layer as a solid lubricant for the mechanical scribing step. However, Toyoda discloses that a thin film of $MoSe_x$ exists on a surface of the metal back electrode layer (Toyoda, para [0008]). This $MoSe_x$ layer would either inherently or would be expected to act as a solid lubricant for the mechanical scribing step as the mechanical scribing step of Toyoda appears to be no different than the instantly claimed mechanical scribing step. Therefore, a rejection based alternatively on either 35 U.S.C. 102(b) or 35 U.S.C. 103(a) is eminently fair and acceptable.

Regarding claim 4, Toyoda discloses that the metal back electrode layer is molybdenum and the first patterning step is conducted by a laser method (Toyoda, para [0004-0007]).

Regarding claim 5, Toyoda discloses that the metal back electrode layer is molybdenum, and the ultrathin film layer formed secondarily on the surface of the metal back electrode layer is molybdenum selenide (Toyoda, para [0004-0008]).

Claim Rejections - 35 USC § 103

14. Claim 6 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 2002-319686 to Shimakawa et al (cited by applicant in IDS, an English translation has been provided with this office action for applicant's convenience).

Regarding claim 6, Shimakawa discloses a process for producing an integrated thin-film solar cell as described above. Shimakawa does not explicitly disclose that the grooves or gaps formed in the second patterning step and the third patterning step have a width of from 30 to 50 μm and a length of 1 m or more, have good linearity, and are formed plurally with close positional relationship. However, where the only difference between the prior art and the claims is the recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior device, the claimed device is not patentably distinct from the prior art device (see MPEP 2144.04 IV). The device resulting from the method of Shimakawa does not appear to perform differently from the device resulting from the instantly claimed method, and as such the instantly claimed method is not patentably distinct from the method of Shimakawa.

15. Claim 6 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 10-200142 A to Toyoda et al (cited by applicant in IDS, an English translation has been provided with this office action for applicant's convenience).

Regarding claim 6, Toyoda discloses a process for producing an integrated thin-film solar cell as described above. Toyoda does not explicitly disclose that the grooves or gaps formed in the second patterning step and the third patterning step have a width of from 30 to 50 μm and a length of 1 m or more, have good linearity, and are formed plurally with close positional relationship. However, where the only difference between the prior art and the claims is the recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior device, the claimed device is not patentably distinct from the prior art device (see MPEP 2144.04 IV). The device resulting from the method of Toyoda does not appear to perform differently from the device resulting from the instantly claimed method, and as such the instantly claimed method is not patentably distinct from the method of Toyoda.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Walck whose telephone number is (571)270-5905. The examiner can normally be reached on Monday-Friday 9 AM-6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571)272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

/Brian Walck/
Examiner, Art Unit 1793